EFFECT OF PARTICLES ON DAILY CAUSE-SPECIFIC MORTALITY IN AN URBAN ENVIRONMENT WITH SAHARAN DUST INTRUSIONS

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Background and Aims: Winds from the Sahara desert transport large amounts of dust to Spain. The presence of high dust concentrations for long periods of time, and the interaction between dust and air pollution, raise concerns about adverse health effects and appropriate interventions by health authorities.
Methods: We investigated the short-term effects of particles (PM2.5 and coarse fraction (PM10-PM2.5)) on cause-specific daily mortality (circulatory, respiratory and cerebrovascular causes) in the city of Madrid (Spain), during days with and without Saharan dust intrusions, between January 2003 and December 2005. Changes of effects between Saharan and non-Saharan dust days were assessed using a time-stratified case-crossover design.
Results: During Saharan dust intrusion days an increase of 10 µg/m3 in the coarse fraction increased daily mortality by respiratory causes by 7.5% (95% confidence interval = 0.1% to 15%), with a lag of 3 days. In contrast, during non-Saharan dust intrusion days an increase of 10 µg/m3 in PM2.5 increased daily mortality for circulatory causes by 3.5% (0.1% to 7%) with a lag of 2 days. No effects of particles were found for cerebrovascular mortality.
Conclusions: Saharan dust outbreaks may have adverse health effects. Further investigation is needed to understand the role of fine particles and the mechanism by which Saharan dust could increase respiratory-specific mortality. In spite of that current air guidelines should be revised for Mediterranean cities with Saharan dust intrusions.